Specific Heat of a Metal Lab

For use with BYU’s Virtual Chemistry Lab

**Directions**

1. Gather your materials, a beaker, graduated cylinder, coffee cup calorimeter, thermometer, stirrer, metal sample and water.
2. Record the identity and mass of your sample.
3. Place your sample in the oven.
4. Fill a graduated cylinder with water, place this water into the beaker and pour the water into the coffee cup calorimeter.
5. Record the starting temperatures of the water and the metal.
6. Place the metal into the coffee cup calorimeter, and record the highest temperature reached.
7. Repeat Twice More; vary either the volume of the water or the starting temperature of the Sample.

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| --- | --- | --- | --- |
|  | Trial #1 | Trial #2 | Trial #3 |
| Identity of Sample |  |  |  |
| Mass of Sample |  |  |  |
| Starting Temperature of Sample |  |  |  |
| Final Temperature of Sample |  |  |  |
| \*Temperature Change of Sample |  |  |  |
| Mass of Water |  |  |  |
| Specific Heat of Water | 4.184 J/g°C | 4.184 J/g°C | 4.184 J/g°C |
| Starting Temperature of Water |  |  |  |
| Final Temperature of Water |  |  |  |
| \*Temperature Change of Water |  |  |  |
| \*Heat gained by the water |  |  |  |
| \*Heat lost by the Sample |  |  |  |
| \*Specific Heat of the Sample |  |  |  |

**Questions**

1. Did varying the volume of the water change the amount of energy the water absorbed?
2. Did varying the volume of the water change the final temperature of the water?
3. Did varying the starting temperature of the metal change the amount of energy the sample lost?
4. Did varying the starting temperature change the final temperature of the sample?
5. Did either of these variations significantly change the calculated specific heat for your metal? Why or why not?
6. Look up a value for the specific heat of your metal (Wikipedia should have it). Calculate your % error.
7. What could cause error in a virtual lab?